The Sewanee Coal Seam, Walden's Ridge and Development

ABSTRACT. The Middle Creek Watershed on Walden's Ridge in Hamilton County has a long history with coal mining. The Sewanee Coal seam contains 20 million tons of bituminous coal on Walden's Ridge, much of it exposed in the Middle Creek Watershed. Recently, the Town of Walden approved the creation of a strip center development located at the intersection of Taft Highway and Timesville Road. A strip center with 40,000 gallons of fuel storage is to be built at the top of the watershed over known mining activity, the coal seam and Acid Mine Drainage adjacent to and under the site. With no protection from zoning, regulations or responsible local government, the community is turning to TDEC to intervene with permitting and then regulation over this environmental disaster in the making.

My name is Anthony Wheeler and I live at the end of Lewis Mine Rd.,Signal Mountain, TN. I have 30 years living on the mountain and a personal experience with the Sewanee Coal Seam. I am a retired scientist/engineer with a range of work experiences including environmental science, medicine, radiation compliance and OSHA.

I initiated a Federal Reclamation Mine Program on my property and for 6 other landowners in 1990. I have created a water treatment pond to partially remedy acid mine drainage(AMD). And I continue to work with TDEC to address sinkholes in the Middle Creek watershed.

With the information that has been provided by TDEC and my personal 30 years' experience with the site, I am alerting the State to a significant hazard posed

by the Lines Orchid Property(LOP) development proposed next to my home and property.

In 1987, I purchased my property “as is” with the belief that the coal mines had been played out. My sons found a large airshaft within weeks of moving into our new home. We contacted Hamilton County, but the County refused to close the shaft with explosives because other areas of the mountain might collapse due to interconnected voids of the old mines. I was directed to USDA Soil Conservation and then the federal Rural Abandon Mine Program(RAMP)(Figure 1) which removed an estimated 30-40,000[1] cubic yards of the Whitwell shale at the highest point of my property and just below Lines Orchid Property (mine 1, Figure 1, reclamation program). To illustrate the depth of cavities, in the process of excavating(mine2), the excavator fell in the shaft up to middle of cab. It took 3 more days and 3 more pieces of equipment to remove the excavator.

These 2 AMD sites on my property(mine 1) and 7 more in the immediate watershed(Figure 10) are all from the Sewanee Coal Seam. Both drainages on my property are continuous. Included(Figure 1) are signed records of the work and participants in this remediation effort and includes the LOP site as confirmed by the owners signatures to the 1990 reclamation projects and maps showing work on their properties.

In 2002, the Raines development along Taft Highway, in the same watershed

was opposed by showing the soils and the drainage for a large development (Planned Unit Development with 40 homes, grocery store, fuel station and small commercial development on 15 acres) were clearly inadequate and the project was rejected.

Last April 2019, when the LOP(Lines Orchid Property) development was publicly revealed, I became concerned about the remediation and the impacts of this development on the coal seam and the Middle Creek watershed. TDEC responded with a physical survey which identified a new sinkhole above mine 1 and other sinkholes above my driveway. Importantly, this provided the 1963 Fairmount Mineral Survey(Figure 2) and the associated map of the Sewanee coal seam(Figure 3) in the Middle Creek watershed. These documents reveal a dangerous deposit of 20 million tons coal and 62 old mines on Walden's Ridge with much of it exposed in the Middle Creek watershed(Figure 3).

The 1963 Fairmount Mineral Survey

Totals from the report for Combustible Coal

RICHLAND	Hamilton	----------	2,071,000	1,651,000	3,722,000
	Total		2,071,000	1,651,000	3,722,000
SEWANEE	Sequatchie	----------	17,000	1,467,000	1,484,000
	Hamilton	2,819,000	3,780,000	2,046,000	8,645,000
	Total	2,819,000	3,797,000	3,513,000	10,129,000
LANTANA	Hamilton	173,000	----------	----------	173,000
	Total	173,000			173,000
				Total	14,024,000

In tons

Times 2(50%) 14,024,000 = 28,048,000 Tons of combustible coal.

This is the estimate of combustible coal on Walden's Ridge and much of it in the Middle Creel Watershed. List of 62 mines on the Ridge.

Mine Names

Vandergriff #1 Mine (inactive)
Grover Louis #2 Mine (inactive)
Inactive mine, name unknown
Richard Louis #8 Mine (inactive)
Inactive mine, name unknown
Murray Mine (inactive)
Dave Frizzell Mine (inactive)
Bollinger Mine (inactive)
Little Mine (inactive)
Johnson Mine (inactive)
Mathis Mine (inactive)
Higdon Mine (inactive)
Inactive mine, name unknown
Inactive mine, name unknown
Inactive strip mine, name unknown
Luan Mine (inactive)
Inactive mine, name unknown

Inactive mine, name unknown
Hicks Mine (inactive)
Serodino Strip Mine (inactive)
Inactive mine, name unknown
Inactive mine, name unknown
Blockton Coal Co. Mine (inactive)
Inactive mine, name unknown
Inactive mine, name unknown
Inactive mine, name unknown
Serodino Strip Mine (inactive)

Inactive mine, name unknown
Inactive mine, name unknown
Inactive mine, name unknown
Inactive mine, name unknown
Inactive strip mine, name unknown
Inactive mine, name unknown
Active mine (1962), name unknown
Inactive mine, name unknown
Doc Spangle Mine (active, 1962)
Roberts Mine (inactive)
Inactive strip mine, name unknown
Tate Mine (active, 1962)
Whitlow Mine (inactive)
Grayson Mine (inactive)
Dill Mine (active, 1962)
Kilgore # 1 Mine (inactive)
Inactive mine, name unknown
Inactive mine, name unknown
Corbin Strip Mine (inactive)
Spangler Mine (inactive)
Inactive mine, name unknown
Vandergriff #2 Mine (inactive)
Kilgore #2 Mine (inactive)
Inactive mine, name unknown
Scott Mine (inactive)

Inactive mine, name unknown
Hawkins Mine (inactive)
Inactive mine, name unknown
Inactive strip mine, name unknown
Inactive mine, name unknown
Inactive mine, name unknown
Inactive mine, name unknown
Inactive mine, name unknown
Lloyd Little Strip Mine (inactive)
Wilson Mine (inactive)

The 1963 survey was conducted by interviews and local families state that the mining activity extended from my property to the other side of Taft Highway directly underneath the LOP site. The lidars provided by the State show 9 (Figure 10) active drainages in the watershed and a number of subsidences (Figure 9). Three subdivisions, multiple homes and the new high school are over the coal seam. Figure 7 shows the broader exposure of our community to coal mines.

The LOP proposal

Figure 4 shows a site diagram at 1823 Taft Highway of a proposed strip center, with this being the only information currently available for the project. The site is to include a 44,000 sq.ft. Grocery store and a fuel station which typically involves a fuel storage capacity of 40,000 gallons stored underground in this case involving steel tanks buried 10 feet under the pavement. The site preparation would involve removing close to 30 feet of mountain sandstone to accommodate fuel, sewage and storm water-management. All this over known mining activity with eroding chambers**,** interconnected mine cavities and millions of tons of coal. Figure 8, created by TDEC, overlays the lidar, properties and the coal seam map to clearly show the hazard that has drawn our concern.

The Hazards

With less than 50 ft of disturbed mountaintop (see Figure 11) over known mining activity, the possibility even probability that a subsidence would occur must be considered. The fuel tanks loaded with fuel and covered by pavement would be almost 500,000 lbs of additional weight on the site. A subsidence could

dump sewage or retained storm water into the watershed causing homes to be flooded, driveway and road damage, and Tennessee River contamination. And since attending the Underground Storage Tank school, it is evident that

1. No regulation over site selection exists. No geological or other identification or assessment of risks from subsidence, or of effects on nearby deposits of coal or other hazards or of vulnerable infrastructure such as wells or pipelines is identified.
2. Responsibilities for proper installation are on tank installers and tank manufacturers instruction to install where directed. No site analysis is required.
3. Monitoring Systems are designed to monitor fuel levels but does nothing to prevent total failures.
4. The tank connections are not engineered to survive a subsidence drop of 6 inches.
5. Action on failure could take days.
6. Contamination of the coal seam would be disastrous because of the potential coal seam fire. Any kind of a fuel spill would quickly reach the shale layer underneath the LOP site and migrate into the interconnected cavities. The volatile organic compounds in the fuels would mix with mine methane creating a highly explosive gas that

would escape through any openings in the surface, including mine openings and air vents which have not been mapped or sealed. Triggered by any kind of ignition source, the following explosions would create ground collapses and a coal seam fire which would last for years. With many examples of coal seam fires in the US and worldwide[2] and examples like Centralia Pennsylvania[3] and many other communities coping with current fires, we do not need to invite this possibility into our mountain community.

NO Zoning, no regulation, no protection for Human Health & Safety.

Hamilton County and the Walden Town Board refuse to acknowledge the presence of the Sewanee Coal Seam and the dangers it represents. Your attention to this desperate situation is needed as developers are prepared to ignore the Sewanee Coal Seam and local government continues to expose the community to these hazards by giving developers a free hand. Since this might represent a unique situation on the Cumberland Plateau, we would ask that the Middle Creek watershed and the Sewanee Coal Seam be treated as an immediate environmental issue and have all permitting in the watershed be subject to environmental risk studies and public review and comment.

With the collapse of coal as a fuel source, the diversion of remediation funds to pensions for coal miners, and the pressure on limited TDEC staff, we would ask the Boards of TDEC to work to create regulations over this hazard as remediation, will not apply to a tank failure, as ordinary remediation by removal of pollutant soils will not suffice, and other irreparable injuries like coal fires not contemplated by the leak response remediation likely will occur. The coal seam will not disappear and pressure from development will be never ending and continue all over the Cumberland Plateau.

Thank you for your time and consideration on this critical environmental matter that threatens the entire mountaintop community of Walden's Ridge. I am available to discuss any of these issues further and help in this matter in any capacity.

Notes

1. Calculation based on shale spoil remnants from 1990 removal.

40Yds x 60yards x 15yards= 36,000 cubic yards.

2. Coal seam fires geology morphology

http://www.sapient-horizons.com/Underground_Fires.html

http://pubs.usgs.gov/fs/2009/3084/pdf/fs2009-3084.pdf

https://editors.eol.org/eoearth/wiki/Natural_and_anthropogenic_coal_fires

3. Current Examples

https://en.wikipedia.org/wiki/Centralia%2C_Pennsylvania

https://en.wikipedia.org/wiki/Byrnesville,_Pennsylvania
https://en.wikipedia.org/wiki/Carbondale_mine_fire
https://en.wikipedia.org/wiki/Laurel_Run_mine_fire

https://www.tampabay.com/news/nation/underground-fires-toxins-in-unfunded-cleanup-of-old-mines-in-west-virginia/2311256

https://www.postindependent.com/news/coal-seam-fire-memories-still-burning-a-decade-later/

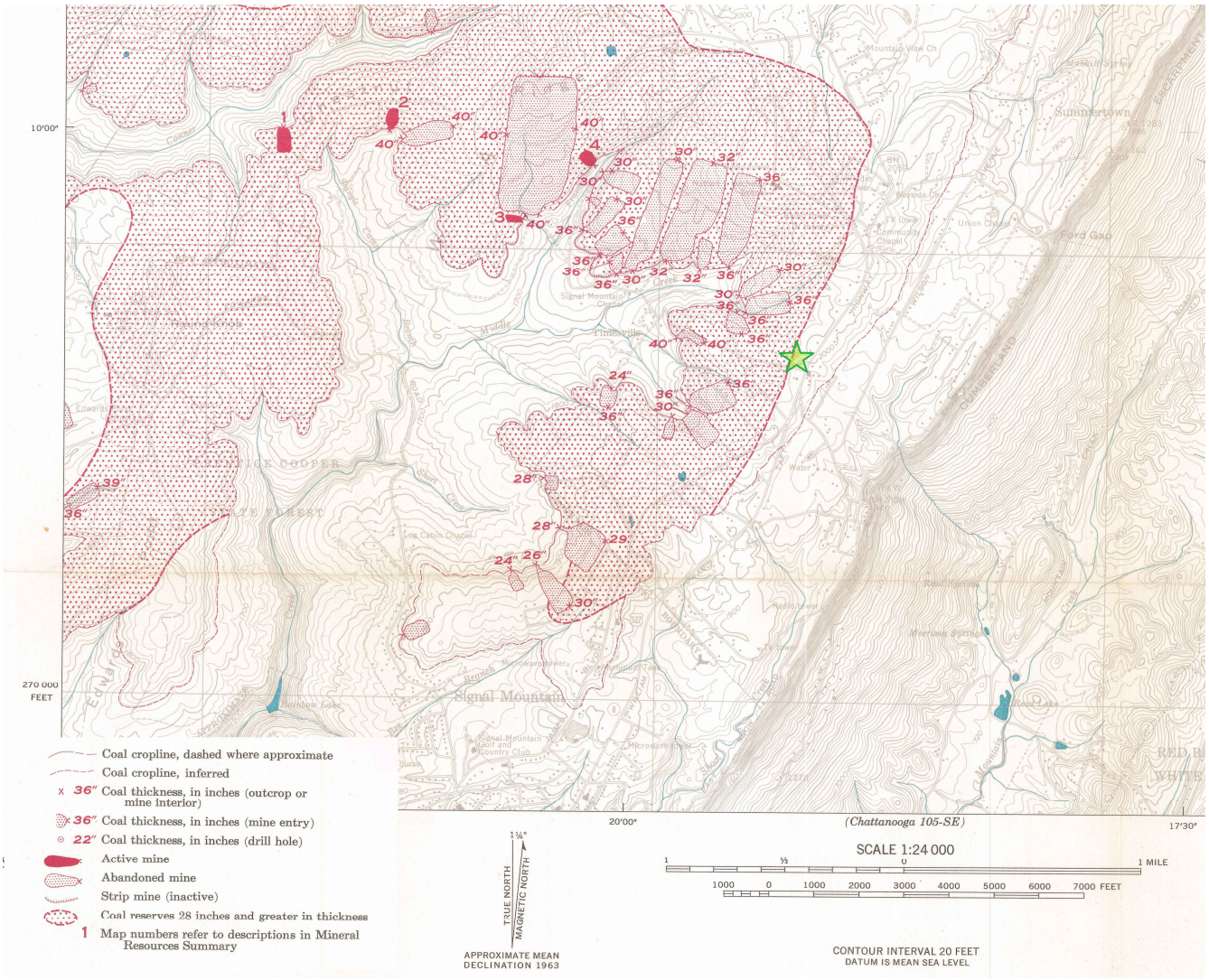
List of Figures

*Figure1. RampprogramLewis Mine.pdf

Includes previous communications to local town council.

*Figure 2. 1963 Fairmount Mineral Resources Survey.pdf

*Figure 3. Fairmount Sewanee Coal Map.pdf



* Documents are TDEC sourced and previously provided

Green Star marks LOP location.

Figure4. Site map.jpg Drawing of LOP site

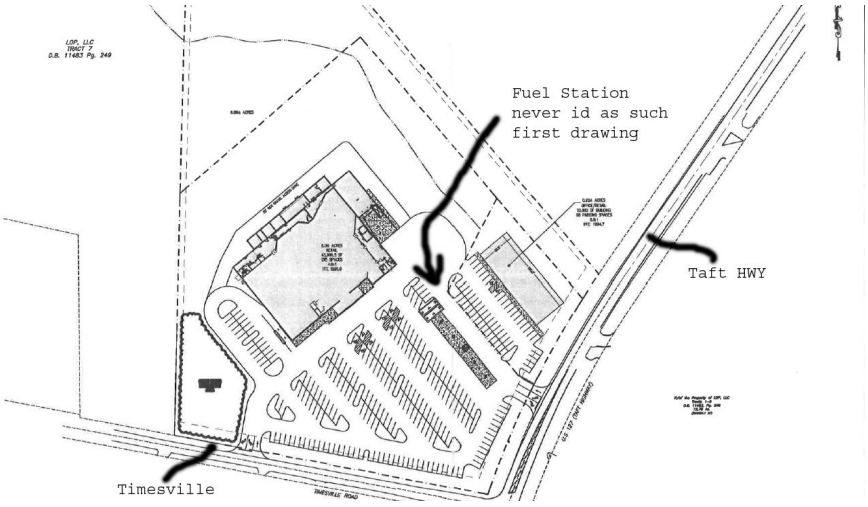


Figure 5. Gis -slopes copy with LOP site and A.Wheeler property

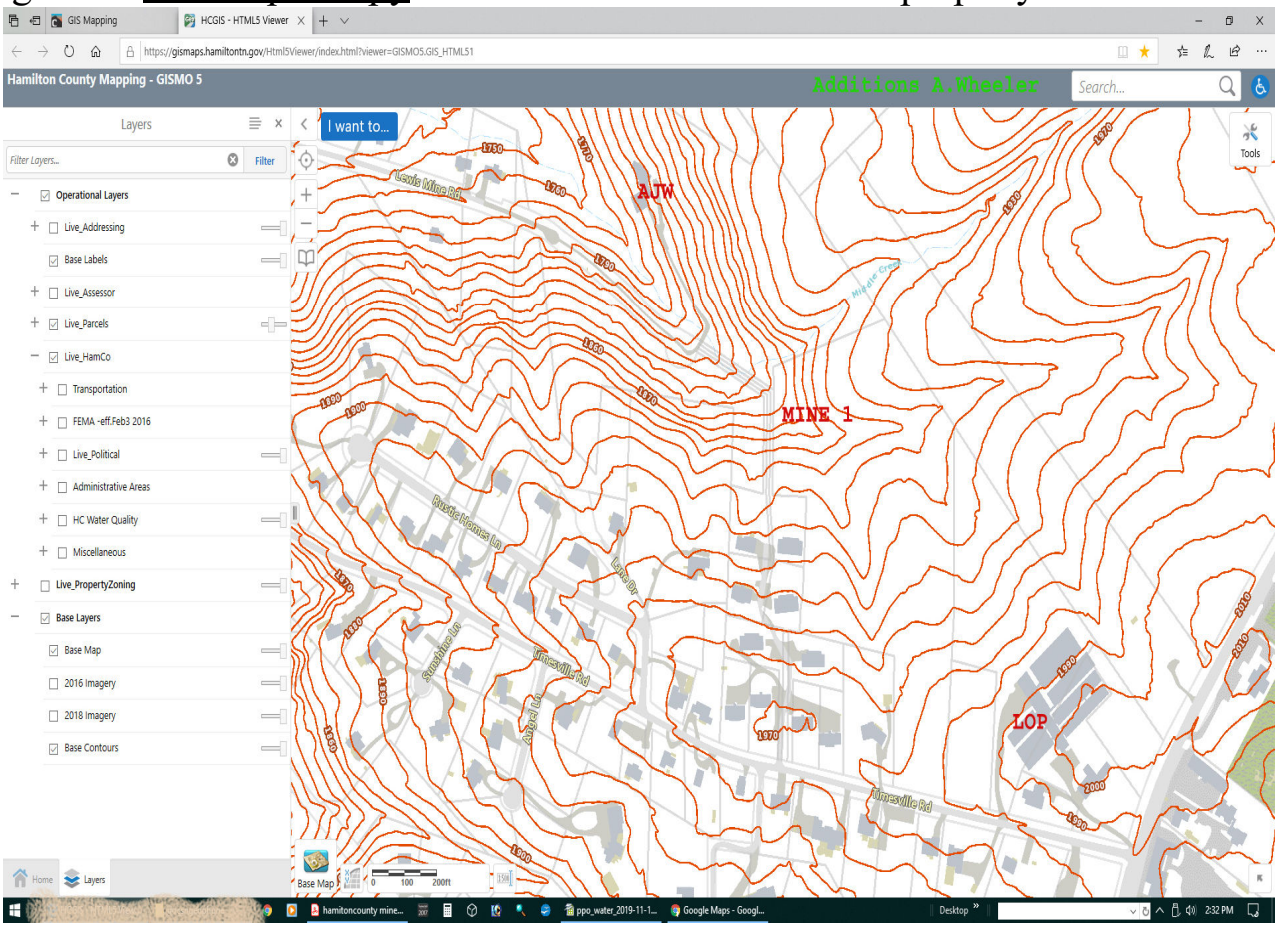


*Figure 6. Timesville Area(1) Lidar with sites Identification

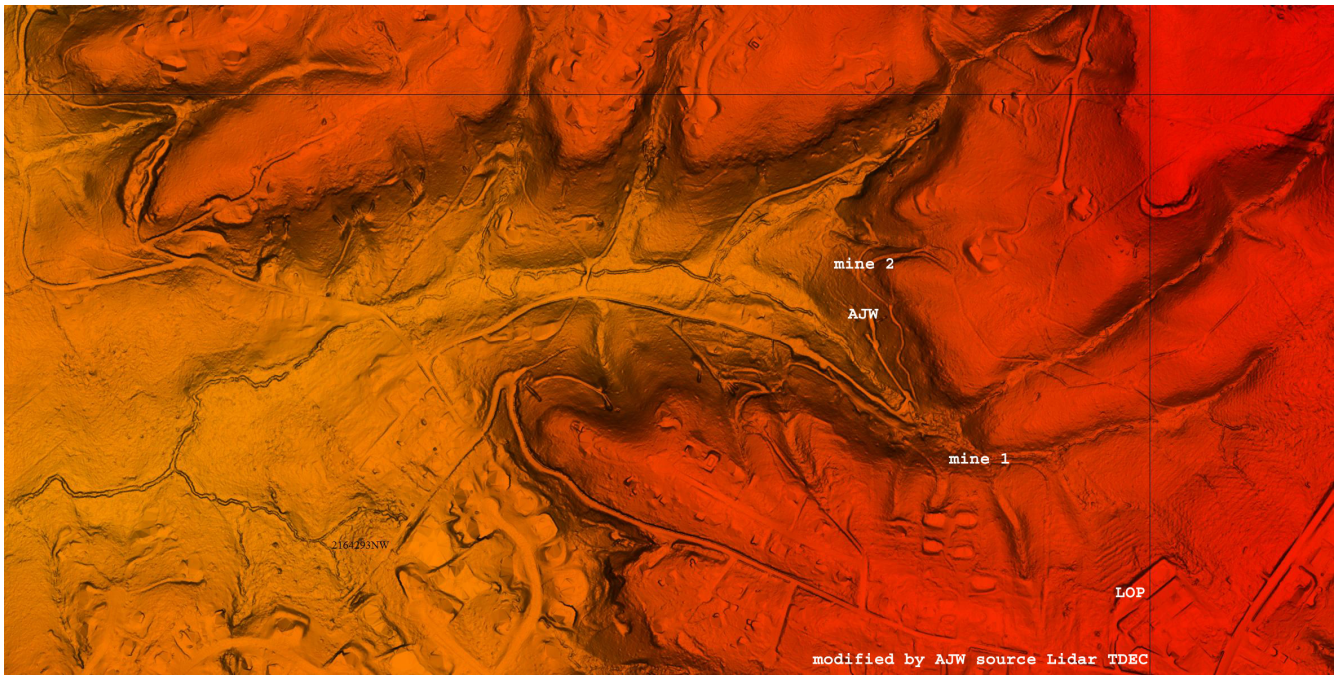


Figure 7. USGS mine locations Local exposure to the Sewanee Coal Seam

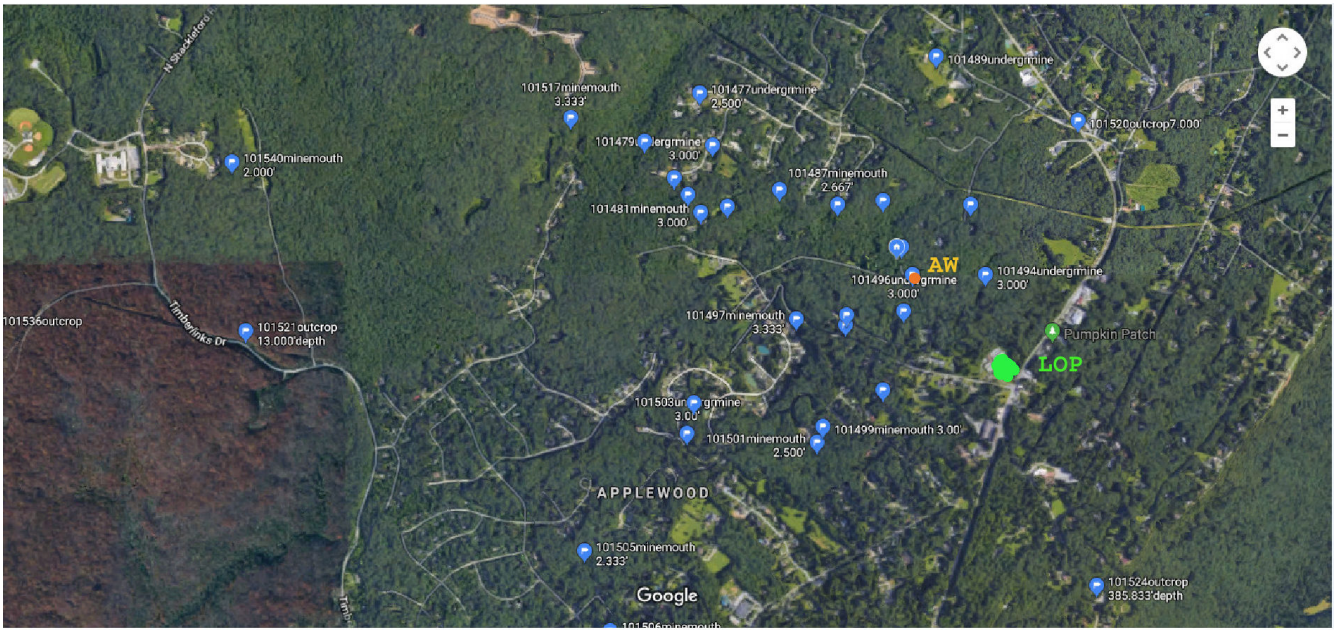


*Figure 8. Walden area parcels coal map Overlay of coal map on land parcels note.36” line of demarcation is mine thickness, not combustible coal.

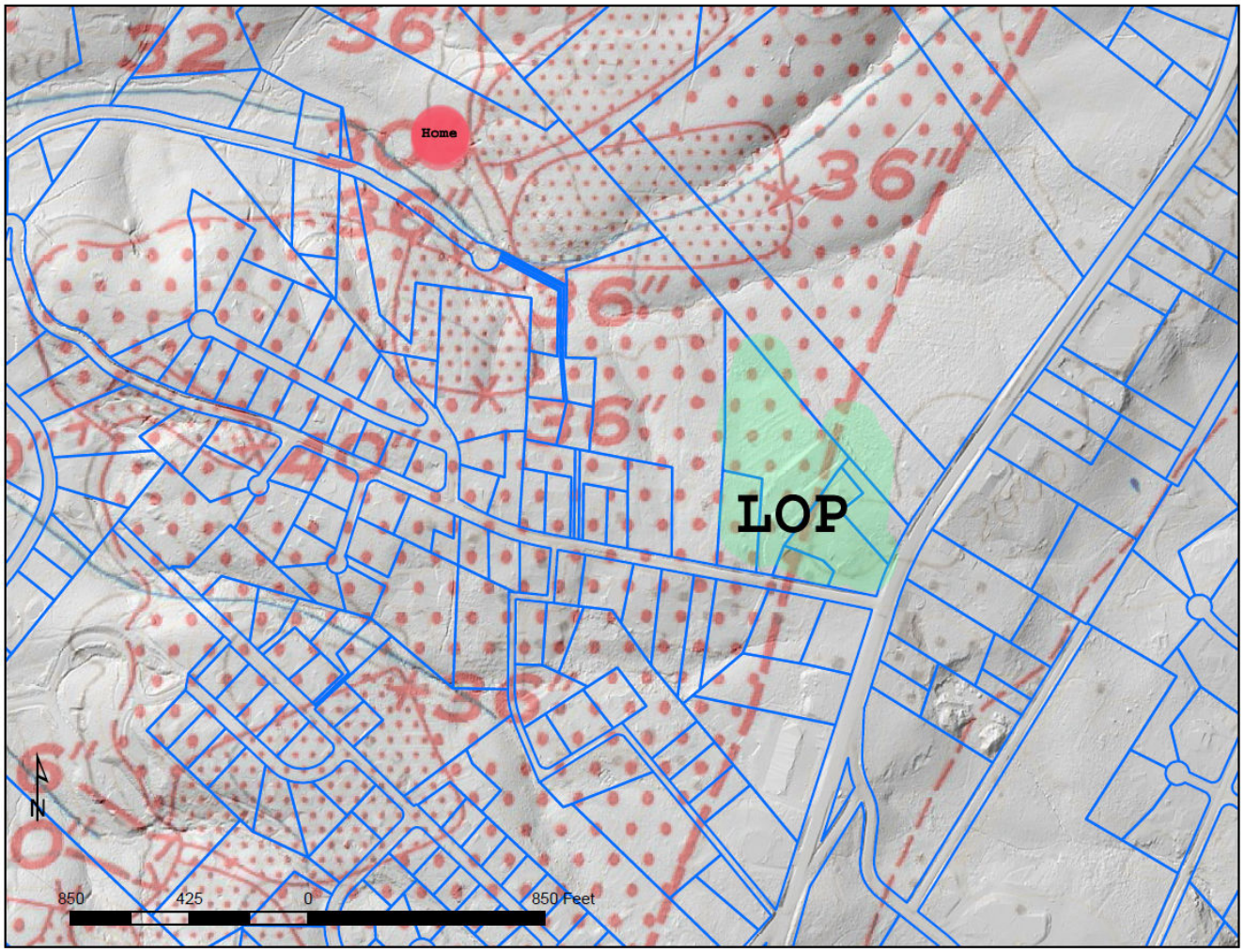


*Figure 9. Zoomlidar Lidar showing sinkholes from airshafts or mine entrances near LOP site.

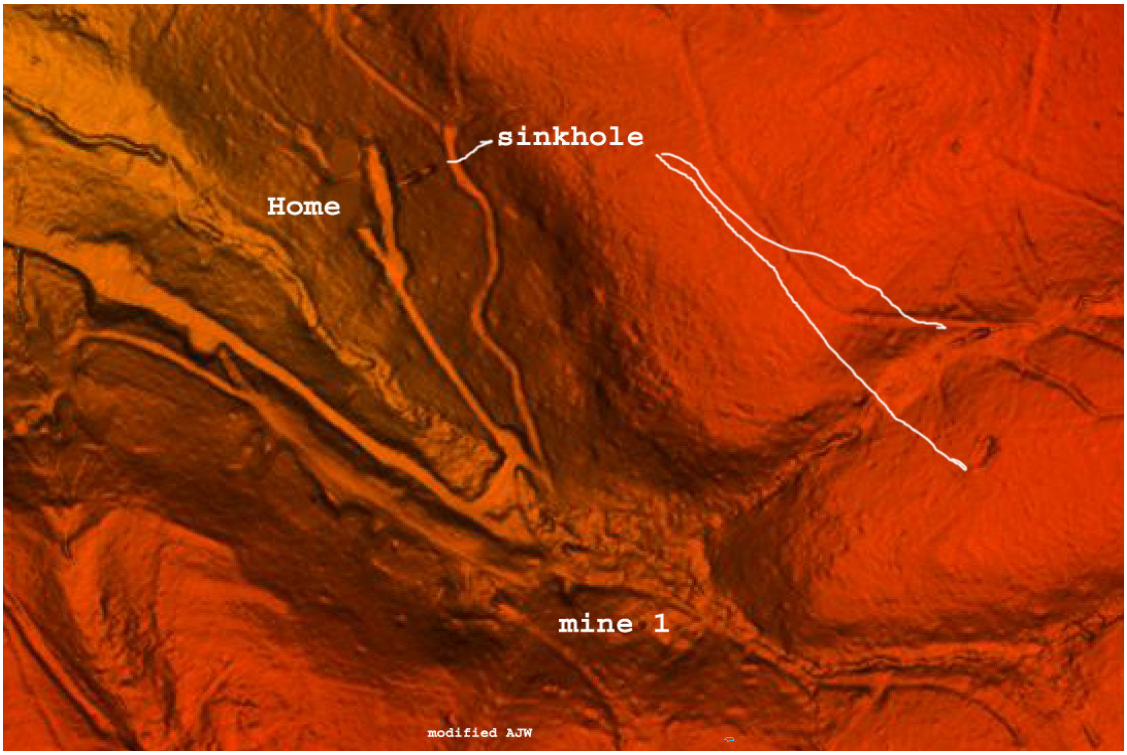


*Figure 10. Active Acid Drainages TDEC image with detail.

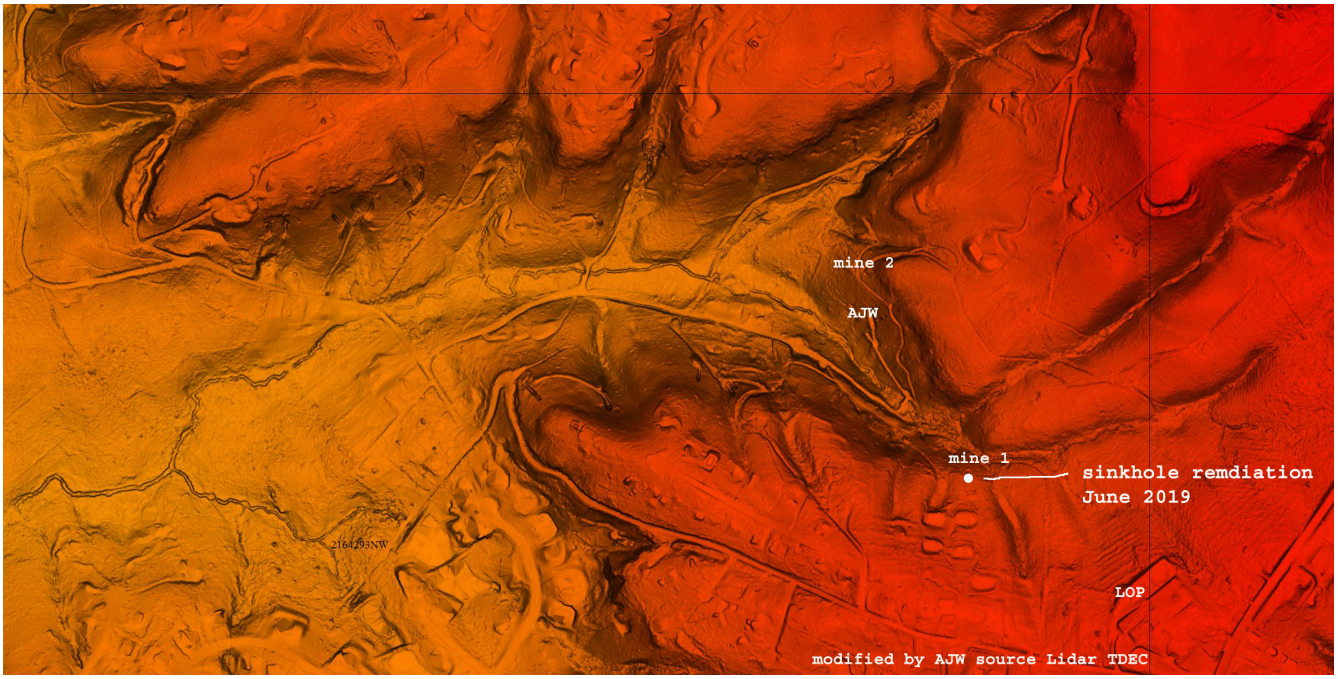
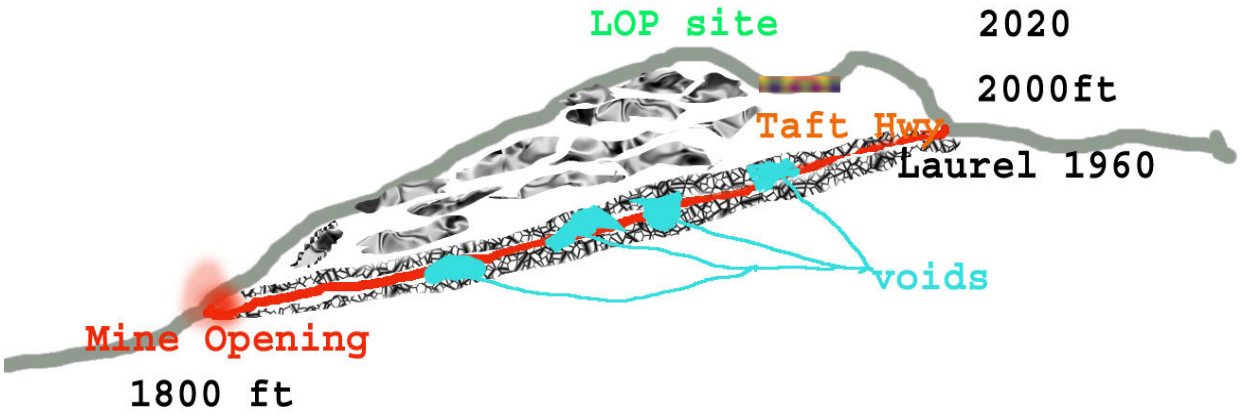
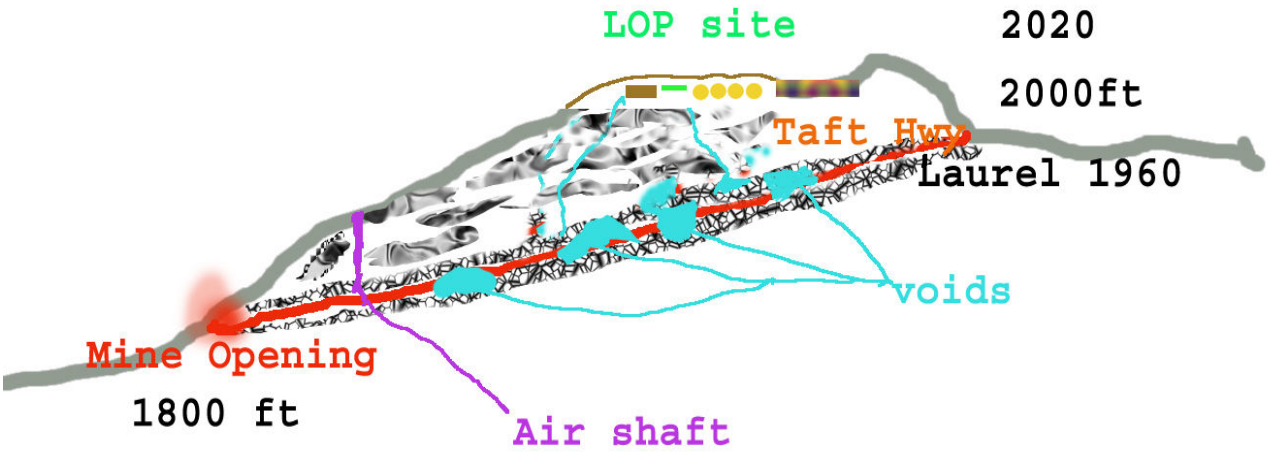


Figure 11. Possible geological profile A&B

Before Removal



After Mountain Top Removal



by A.Wheeler